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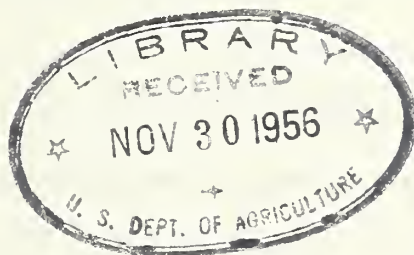
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Preliminary Report and Analysis of the Need For
Strategic Stockpiling of Food in the
United States and Its Territories
And In Foreign Countries

A Report Developed in the
U.S. Department of Agriculture
Pursuant to The Agricultural Act of 1956
Eighty-Fourth Congress



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PRELIMINARY REPORT AND ANALYSIS OF THE NEED FOR
STRATEGIC STOCKPILING OF FOOD

Part C

Summary

1. National shortages of a few processed foods could result from losses of stocks and processing facilities in a bombing attack.
2. Temporary local shortages of some finished foods might follow the destruction of local stocks and facilities, even though the total national supplies were adequate.
3. Stockpiles of such imported items as coffee, tea, cocoa, sugar and spices may be desirable as a safeguard against possible shortages of ocean shipping in wartime and possible problems of moving these products through damaged ports.
4. U. S. territories and possessions may need strategic stockpiles of food to offset possible bomb damage and possible interruptions in ocean shipping, but very little positive information is available on this question.
5. Strategic stockpiling in foreign countries, including our allies in NATO, is not likely to be initiated on a substantial scale unless the U. S. assumes most or all of the cost.
6. The establishment of food reserves for natural disasters in underdeveloped countries is a possible means for transferring from this country moderately important quantities of the U.S. surplus foods.
7. Advance planning for distribution and use of available food and facilities might disclose less expensive means than stockpiling for assuring adequate food supplies for most areas receiving evacuees in a post-attack period.
8. The greatest problem in civil defense stockpiling would be the rotation of the food in the stockpile, so that it can be used before it spoils and, at the same time, dispose of it in a manner that will not disrupt the normal food markets.
9. A warehouse construction program probably would be required to provide storage facilities for any stockpiles to be established for local areas that might receive evacuees after an attack.
10. Very few of the surplus foods now owned by the Commodity Credit Corporation are processed and packaged in a form that would be suitable for civil defense area food stockpiles.
11. Much additional information is needed to provide an adequate basis for determining the amounts and types of foods that may be desirable to include in any food stockpiles.

Introduction

The Agricultural Act of 1956 provides in Section 201(b) in part as follows:

"(b) The Secretary shall submit to Congress within 90 days after the enactment of this Act detailed programs, with recommendations for any additional legislation needed to carry out such programs, (3) for strategic stockpiling of foodstuffs and other agricultural products (A) inside the United States and (B) outside the United States "

This report has been developed as a means of providing the presently available information for the report requested in the foregoing language.

It is assumed that the term "strategic" in Section 201(b) of the Agricultural Act of 1956 is intended to refer to a need for stockpiling as a safeguard against shortages in the event of an enemy attack. Within the context of Section 201 of the Agricultural Act, it appears that the utilization of surplus commodities presently held by the United States Government is one of the objectives sought by Congress. In developing this report, however, it has been concluded that the subject must first be approached from the standpoint of determination of need for stockpiling without regard to the source of the commodities which it might be determined should properly be stockpiled for strategic purposes. Following such a determination, if it is concluded that some stockpiling measures are appropriate and desirable, it would then appear logical to consider the extent to which commodities in the inventory of the Commodity Credit Corporation might appropriately be included in such stockpiles.

In considering the desirability of stockpiling food for strategic purposes it has been concluded that the matter should properly be approached from two standpoints. First, there should be an analysis of the question of whether the Continental United States or other country or territory, as a whole, would be short of food under any realistic set of assumptions regarding nuclear attack and, second, there is need for study of possible needs for area or localized stockpiles. It may be quite possible that, even with an adequate national supply of food, local needs could not be met because of transportation disruptions.

Factors To Be Considered In Stockpiling Decisions

Conclusions as to the desirability of either a national stockpile or area stockpiles must be based on consideration of the obstacles and difficulties which are certain to be involved in any stockpile undertaking. These difficulties and obstacles are reviewed here briefly in order to make completely clear the fact that a strategic stockpiling need must be urgent and compelling in order to justify the substantial expenditures in manpower, money and other resources which would be entailed.

Perhaps the most complex problem involved in a stockpiling program would be that of rotation and management of the food supplies involved. A stockpile developed for strategic purposes would include primarily those foods which are in processed form and readily convertible into a form consumable by refugees and others. Foods of this character, although storable for substantial periods of time under satisfactory storage conditions, nevertheless do reach an age when they must be rotated into use and replaced with fresh supplies, or alternatively must be destroyed as no longer fit for human consumption. Outlets for foods of this type other than regular commercial outlets are not substantial. Therefore, if a significant quantity of food is to be stockpiled and if such food is not intended to be rotated into distribution in competition with commercial supplies, it must be recognized that the cost of the food stockpiled would not likely be recovered and that a new expenditure would be involved when replacement of food in the stockpile became necessary.

While it is true that some surplus commodities could be converted into a form suitable for strategic stockpiling, if a stockpile is deemed necessary, the great majority of the items which would be required in a well rounded stockpile are items which are not now in surplus supply in the United States. Therefore, stockpiling of such items would result in the creation of stocks in excess of normal needs. In the absence of a clear understanding at the outset of an intended use or disposition other than domestic distribution, the additional stocks of these commodities would have a depressing effect upon prices, thus resulting in important economic consequences to both producers and distributors.

If stockpiling is deemed necessary for strategic purposes, it would be logical to assume that such stockpiles should be placed in localities somewhat removed from the centers of population which are vulnerable to enemy attack so that the foods would be available for consumption by evacuees from such population centers, as well as by other segments of the population. Storage facilities of the type required for a stockpiling program are not likely to be available in these dispersed localities since normal peacetime distribution practices do not logically result in concentrations of foods at outlying points. Therefore, the implementation of a stockpiling program would probably call for substantial construction of storage facilities.

In connection with the matter of storage, it is pertinent to note that maintenance of maximum storage life of commodities requires, in most instances, specialized types of storage. Generally speaking, the storage life of processed commodities is substantially longer when held at 40 degrees Farenheit temperature than at higher temperatures. Thus, wheat flour, for example, can be stored safely in multi-walled paper bags for about a year at 70° Farenheit and for about two years at 40° Farenheit (Appendix Table 1). Margarine loses its freshness in two years at 70° Farenheit, but remains in good condition for five years at 40° Farenheit. Most items may be held two to four times as long at 40° Farenheit as at 70° Farenheit. These data are preliminary and further study of keeping time is needed for a number of the listed commodities and for some that are not listed. Non-foods are not included in the table, but wool, for example, must be kept dry and free from insects. Cotton and tobacco may be stored for long periods without deterioration, except for some color deterioration in the case of cotton.

Once set up, a stockpile of food could not be forgotten. Constant attention would be required to assure the continued quality and condition of the commodities stored. Experience of the Commodity Credit Corporation in the maintenance of its stocks indicates that the cost of management and periodic inspection is substantial.

All of the foregoing factors necessarily must be taken into account in arriving at a decision with respect to stockpiling. Clearly, a strategic stockpile would involve substantial expenditures of money and would require continuing expenditures if the stockpiling is to serve its intended purpose. The need for stockpiling, therefore, must be examined critically and it must be clear that no satisfactory alternative exists for the safety of our population before undertaking the massive and expensive task involved.

With the foregoing considerations in mind, other factors pertinent to a decision on the need for a national stockpile and the need for area stockpiles have been explored.

Analysis Of Normal Supply, Stocks And Consumption In Continental U.S.

An analysis of our normal food supply, its composition, stock levels and normal consumption levels is quite pertinent to the assessment of the stockpiling question. No segment of the population would be totally dependent upon stockpiled food in a war emergency unless disruption of transportation was so serious that all locally produced foods and local food stocks were destroyed or exhausted before transportation could be resumed. From a national standpoint, the U. S. is dependent on imports for only a relatively small portion of its food supply. Even the six New England states, as a whole, would not immediately require outside assistance or special food stockpiles as a result of transportation disruption. Food in homes, retail stores, wholesale establishments, cold storage plants, locker plants, processing plants and "in transit" would be available. Supplementing such supplies would be locally produced foods which generally would not be greatly affected by bombing of target cities. These would include daily production of poultry, eggs and livestock products, which are produced in some volume in all sections of the country. Fresh fruits and vegetables from local production would be available in season.

Stocks of the daily produced commodities at any time during the year are small in relation to the annual consumption rate (Appendix Table 2). On the other hand, each of the food grains is harvested only during one short season each year and the carry-over of old crop wheat and rice this year is more than enough to meet all requirements for the year, without using any part of the new crops. Per capita consumption of food in U. S. amounts to about three-quarters of a ton per year. Of this total, in 1955 nearly half of the caloric value was comprised of items produced daily throughout the year, such as meat and dairy products (Appendix Table 3). Cereal products, in grain equivalent, consumed in the U. S. in 1955 constituted about 21.4 percent of the total calories consumed.

Analysis of Potential Destruction of Food and
Food Processing and Distributing Facilities
Under Assumptions of Operation Alert, 1956

It must be recognized, of course, that some destruction of food processing and distributing facilities, as well as production resources, would occur in a nuclear attack. While it is difficult to assess the full extent of such destruction, it appears unlikely that destruction of actual food supplies would be of a magnitude to warrant a national food stockpile. In the case of food processing and distributing facilities, some categories would likely suffer substantial damage.

It appears desirable to draw upon experience gained during Operation Alert 1956 in considering the effects of an attack on food and facilities. Different assumptions would produce different destruction patterns, but the analysis made during the alert will provide some perspective. The following analysis of damages to major commodity groups is based on the assumptions of the 1956 Operation Alert.

Livestock and Meat

Losses of stocks from bomb blasts would be less than 1 percent of annual production. Fallout losses expected to be less than 2 percent of annual production. Loss of processing facilities in Omaha and Chicago would require some significant marketing diversions and create temporary local problems, but other processing facilities could increase their operations and handle all livestock marketed for slaughter. More meat would be available than consumers would be expected to want but distribution might be a problem in local areas.

Cotton

Less than 4 percent of the supply would be destroyed. Huge surplus makes loss insignificant. Loss of the chemical linters pulp plant at Memphis might cause problems for users of its products. No other significant problems from loss of stocks or facilities are foreseen.

Dairy

Stocks in bombed cities are assumed destroyed. Fallout may result in milk from some areas being unusable but extent of such areas unknown. Adequate supplies of milk would be available from other areas. Local shortages and surpluses would result from transportation interruption. Up to 15 percent of the processing facilities would be damaged or unusable and there would be some transportation problems in diverting milk from affected areas to processing plants in other areas.

Tobacco

No major problems. Only minor loss to manufactured cigarette stocks. Some damage to cigar manufacturing facilities and stocks.

Naval Stores

Very little blast or fallout damage.

Wet Corn Milling

Two plants out of 14 were located within fallout areas and might be temporarily unusable. Capacity of these two plants is about a third of the total of the industry.

Dry Corn Milling

About 9 percent of capacity would be damaged or destroyed. Other plants could increase milling to offset this loss.

Yeast Industry.

Up to 40 percent of facilities would be destroyed, damaged or in fallout areas. This would create serious problems in distribution but available supplies could be stretched to cover essential needs for bread, etc., if priority transportation could be provided.

Poultry and Eggs

Losses of live poultry, poultry meat and eggs would be small. Stocks of dressed poultry and eggs normally represent only one week's consumption and only part of this would be lost. Largest loss would be frozen eggs in storage in cities. Less than 10 percent of poultry processing facilities are near target cities. Only part of it would be damaged. Other plants could process all poultry. With estimated loss of population, there would be local surpluses of poultry products.

Fruits and Vegetables

There would be heavy damages to processor and distributor stocks of canned fruits and vegetables (possibly up to 40 percent). Fallout would make some growing crops unusable. About 5 percent of total processing facilities would be destroyed and losses would be much higher in some important areas such as California, Philadelphia, Pittsburgh and Chicago. The major problems would result from shortages of cans for processors and in transporting fresh products to consumers. Two-thirds of the normal market outlets for fresh products would be disrupted through bomb damage, evacuation of people, disruption of transportation, etc. Development of new routing and marketing patterns would be necessary immediately after transportation is restored to avoid huge losses of food through lack of markets.

Coffee, Tea and Spices

There would be heavy losses, both of stocks and of processing facilities. Shortages are expected if imports are cut and until alternative processing facilities can be placed in operation.

Sugar

There would be no damage to facilities processing domestic production of beet and cane sugar. Same for Puerto Rico. About 18 percent of Hawaiian raw cane

mills and all of their refineries would be damaged. About 63 percent of U. S. capacity for refining imported raw cane sugar would be completely inoperative. About one-fourth of U. S. sugar stocks would be damaged or destroyed in the attack. Replacements would require stepped-up imports of refined and raw sugar with resulting increase in transportation. Controls would be necessary on sugar use and distribution at least in the period immediately following the attack.

Fats and Oils

Heavy concentration of oil stocks in target areas would result in heavy damage and destruction of stocks, particularly in the Northeast. Oil refiners also are heavily concentrated in bombed areas and insufficient capacity would remain to handle available and needed oil. Losses of oilseed crushing facilities would be low, except for flaxseed, but the remaining refiners would be unable to handle the volume of oil from crushers. Immediate replacement of at least half of destroyed oil refineries believed necessary. Peanut butter plants are also concentrated in damaged areas.

Flour

About 28 percent of milling capacity would be damaged or destroyed but remaining mills could meet needs. Would greatly increase transportation problem as much of remaining facilities would be long distances from flour-short areas. Loss of flour stocks estimated at 15 percent and serious only until transportation can be restored. No shortage of wheat for milling.

Molasses

Over a third of the tank storage and terminal facilities in damaged areas. Some damage to barge-truck distribution facilities. Major problem would be facilities to unload and store in ports. Would result in reduced supplies for livestock feed since other uses would probably have priority if and when facilities are restored to use molasses for production of alcohol.

Grain Storage Facilities and Stocks

There would be heavy loss and damage to grain, located in terminal facilities varying from 10 to 50 percent of capacity in individual areas and totaling up to about 200 million bushels. This, however, would represent only about 7 or 8 percent of present large supplies of wheat and lower percentages of most other grains. The only difficult problem, however, would be in routing shipments of grain to avoid use of damaged terminal facilities. Farm storage and other elevator storage would suffer insignificant damage and remaining elevators could provide all necessary blending and cleaning services. Possible loss of grain stocks is not considered a problem. Some damaged stocks of food grains would be salvaged for livestock feed.

Refrigerated Warehouses

About 41 percent of the refrigerated warehouse capacity was in areas damaged in the assumed attack. Greatest loss would be in the Northeast. Loss of food would be less than 41 percent since a considerable portion of the food in damaged facilities could and would be salvaged and used. Food losses would cause only temporary and local shortages of a few items.

Food Distribution Facilities

An estimated 30 percent of the wholesale distribution facilities and 15 to 20 percent of the retail facilities were in areas assumed to be bombed. Losses would vary greatly by states with heaviest losses in New York, California, Maryland, Connecticut, New Jersey and Pennsylvania.

Some Measures for Avoiding Shortages Without Stockpiles

Operation Alert indicated that in several fields, such as raw sugar and vegetable oil refining, shortages of the finished products might result even though there were adequate supplies of the raw products. Temporary area shortages of other products, such as flour and fresh vegetables, might result from either loss of milling facilities or disruptions in the regular distribution systems. Planning for preventing these losses and disruptions would lessen the need for stockpiling to overcome such temporary problems.

In the case of vegetable oil refining, one possible solution would be to encourage new oil refining facilities to be located in relatively nonvulnerable areas. Also, a greater use of unrefined oils would be possible. The same would be true for storage facilities for raw and refined vegetable oils and for users of refined vegetable oils (i.e., manufacturers of salad oil, margarine, etc.).

In the case of flour, immediate shortages due to loss of normal milling facilities could be overcome by use of local feed mills and farm grinding equipment for milling available wheat and other grains to produce a useable type of flour. The major problem in providing bread would be the possible lack of yeast in sufficient quantities to keep bakeries operating in areas where yeast plants were damaged or distribution facilities had ceased to function. No immediate solution for this problem has been found and it needs further study.

Coffee roasting equipment was presumed to be heavily damaged in the Operation Alert problem but if green coffee beans were available, peanut roasters and other emergency methods could be used to roast the coffee. Most grocery stores have grinding equipment. Fancy packaging and vacuum packing would not be necessary.

Reorganization of the distribution system for all food but particularly for perishables, such as fruits and vegetables and milk to avoid or replace damaged and destroyed facilities and areas would be necessary both to feed the people and to avoid spoilage of the food before it could get to consumers. Much of this must be planned locally and would depend in part on local evacuation plans. Increased or quicker availability of fresh foods would mean better emergency period diets and less dependence on commercial stocks or special stockpile food supplies. Agriculture's market news service might well assist in a plan to advise farmers how and where to market perishable foods in the period immediately following an attack.

Additional Factors Affecting Area Stockpiling Decision

In the foregoing discussion, primary consideration has been given to the question of need for a national stockpile. Once a conclusion is reached on that question, consideration of area stockpiling is simplified. If a need exists for a national stockpile, an area by area study would follow to determine appropriate strategic placement of such stocks.

If it is concluded that a national stockpile is not needed, the only basis for establishment of area stockpiles would be that available supplies in a particular area would be exhausted before transportation capabilities would permit shipments into the area, or that destruction of processing facilities would be so serious as to require area stocks for use until processing facilities can be re-established. In other words, area stockpiles would buy time before resumption of normal or near normal processing and transportation facilities becomes necessary.

Insofar as transportation is concerned, Operation Alert 1956 experience does not indicate a serious problem. This experience is discussed in earlier pages of this report. Even under more serious assumptions as to damage than resulted in the alert, it would appear that, with assignment of a high priority for food transportation, the needs for movement of amounts of food necessary to supplement local production could be met in most, if not all, areas. When the cost and complexity of stockpiling is considered, there can be no doubt that the assignment of high priority to food movement, even under the most serious attack situation, is fully justified.

If potential destruction of processing facilities is considered as a basis for establishment of area stockpiles, serious question exists as to whether it may not be more economical to encourage dispersal of facilities of the more vulnerable categories or to create standby facilities.

It is perhaps pertinent to consider also the possible influence of radioactive fallout on conclusions regarding stockpiling. On the basis of fallout patterns assumed for Operation Alert 1956, it was estimated that food losses from fallout would be no more than three percent of total annual food production. However, much more information is needed on the effects of fallout before firm conclusions can be reached. It is quite possible that foods assumed to have been lost in Operation Alert due to fallout, may actually have been salvageable.

The effect of fallout on transportation also requires further study, although as previously indicated, transportation authorities did not indicate that this would have been a serious obstacle under Operation Alert 1956 assumptions.

It is possible also to visualize other serious problems, such as introduction of chemical or biological warfare agents, which could reduce the national food supply or the supply in a particular area. There are no assumptions available to aid in measuring this hazard, however, and perhaps it is of no greater order of magnitude than the hazard of sabotage to the food stockpile, if one is established.

It would appear that relatively small expenditures to encourage construction of additional plants in nonvulnerable areas to replace or supplement a few types of processing facilities now concentrated in target areas would go far toward eliminating the need for stockpiling the products involved. Any measures taken in advance to speed up restoration of transportation, particularly into refugee areas, will also reduce the need for food stockpiling. A pre-attack plan for directing post-attack food shipments into the food deficit areas with the most urgent need would also decrease the need for stockpiling.

On the basis of the present analysis of conditions under Operation Alert 1956 assumptions, it is uncertain whether either area or national stockpiles of food would have been justified. In this exercise, the transportation agencies indicated that rail or truck transportation could be restored into all major sections of the country within a very few days following a nuclear attack. Railroads indicated that they could restore lines or bypass damaged areas and continue to move freight. Truck traffic, as well as railroad traffic, would suffer some delay and require rerouting as a result of loss of key bridges but trucks are easily rerouted and truck movement of food could be restored to evacuation areas as quickly as communications could be restored to advise what, where and how much food was needed and what damage had been done to roads and facilities.

The effect of fallout on transportation interruptions was not fully reflected in Operation Alert 1956 but possibly reflects about what would happen under actual post-attack conditions. Both trucks and railroads would probably continue to move at least essential cargos through fallout areas if the physical conditions of the road or roadbed would permit the vehicles to move. Whether the calculated risk to persons so moving food should be permitted is unknown but as long as this type of movement is to be expected, then it appears that supplies of food could be moved into almost any area housing evacuees before locally available food stocks would be exhausted.

The primary problem in supplying food in a period following an attack would be the distribution of food to consumers from the bulk shipments or stocks in or near the vicinity in which it is needed. Often the wholesale distribution system in the evacuation area would be either inadequate for the increased number of people or the facilities serving the area would have been destroyed or heavily damaged. This points strongly to a need for state and local civil defense people to develop emergency distribution systems or plans, including (1) procedures for breaking down car or truck-load shipments into the sizes of lots needed by people in the area for a one or two-day period at a time, (2) how to move food from the points of unloading to consumers, (3) what and how to provide the minimum packaging and processing that would be needed (i.e., packaging of in-shipments of flour, cooking of food, butchering of local livestock, etc.), (4) preparation of advanced estimates of needs for timely planning of shipments, (5) how to maximize use of locally produced or available foods, and (6) advanced planning, clearing the way for local requisitioning of needed local food stocks including grocery store stocks, processor stocks, farm produced milk, eggs, etc., frozen food locker plant stocks, warehouse supplies, etc.

Analysis of Situation With Respect to Imported Foods

The situation with respect to imported foods involves more difficult problems than is the case with domestically produced foods. U. S. ports might be expected to suffer heavy damage in a nuclear attack, and ocean shipping would undoubtedly be seriously affected, at least temporarily.

A resume of pertinent facts and considerations with respect to our principal food imports follows:

Sugar

Among our agricultural imports, sugar constitutes by far the greatest tonnage. Wartime sugar import requirements are estimated to be in excess of four million tons annually, or about one-third of all imports of agricultural products. Also, there is a concentration of raw cane sugar refining capacity in coastal cities considered to be priority targets for any nuclear attack on this country. In addition the northeastern states which would likely suffer the heaviest attack damage are normally dependent on imported sugar and would be most difficult to supply out of domestically produced supplies. If any agricultural items are to be included in a stockpiling program, it would appear that sugar would be on such a list.

Molasses

By tonnage, molasses is our second largest import totaling from 2 to 2.5 million tons annually. Primary uses for molasses, such as for manufacture of yeast, could be supplied out of domestically produced supplies. Difficulties in storage, the availability of other types of animal feeds and the availability of some domestically produced molasses for essential uses would appear to rule out any need for stockpiling molasses.

Coffee

By weight, coffee is our third largest agricultural import and by value, our most important agricultural import. None is produced within continental United States. Coffee is important in wartime as a morale builder. It was among the first items rationed during World War II and the rationing was the result of shortages of shipping rather than shortage of coffee in the producing areas. In a nuclear war, shipping shortages and lack of port facilities might both be expected to limit coffee imports. It would appear that if agricultural products are to be stockpiled, coffee should be considered. It appears probable that any coffee stockpile should be in the form of green coffee beans and the stockpile facilities might need to include emergency roasting equipment for emergency feeding operations.

Tea

The volume of tea imports is small relative to coffee and sugar but it too has important morale value for wartime. All tea is imported and nearly all comes from relatively long distances and from areas where there might be considerable shipping risks in wartime. Tea, it would appear, should be considered for inclusion in any national or area stockpile of food items for emergency period use.

Cocoa

This country is completely dependent on imports for cocoa beans and other forms of chocolate. Cocoa products have both dietary and morale value and like tea and coffee would be items for inclusion in any national or area stockpiles.

Spices

Many of the spices used in seasoning and preservation of foods are imported from distant areas from which it might be difficult to obtain supplies in wartime. Very little data with respect to household and industry stock levels is available, but it is likely that available supplies of most spices in households and at retail and wholesale would meet consumer needs for a considerable period of time. Processor stocks of spices as well as the facilities for grinding, processing and packaging are concentrated in vulnerable areas and a major share might be damaged or destroyed by nuclear attack. Pepper and possibly other items merit consideration for stockpiling, but the entire group requires further study and analysis before final conclusions can be reached.

Oilseeds and Oils

Peacetime imports include about a half million tons of vegetable and animal fats and oils and oilseeds. Certain special products in this group are already included in our national strategic stockpile because of their industrial and military uses. These types represent a relatively insignificant part of our total imports, the bulk of the imports being used for production of soap and related products. Since this nation is a large net exporter of fats and oils, it appears doubtful if any imported fats, oils or oilseeds need to be stockpiled for their value for human food. Any stockpiling of these items would need to be justified on the basis of their non-food uses. There are no food uses for imported fats and oils for which domestically produced products cannot be substituted for the imported items.

Fruits and Vegetables

This nation imports large quantities of fruits, particularly bananas and pineapple, and some vegetables. With the exception of canned pineapple, most of these imports are fresh fruits and vegetables and thus could not be stockpiled. However, since canned pineapple and other imported canned fruit and vegetable products supplement similar domestically produced commodities, separate consideration is not deemed necessary and these imported canned fruits are considered together with other canned fruits.

Fish and Meat

A major part of our fish and meat imports are in perishable form and as such are unsuitable for stockpiling. Canned fish and meat whether domestically produced or imported would be valuable for emergency feeding and, if area stockpiles are determined desirable, would be considered along with domestically produced supplies as a source for stockpiling. It appears doubtful, however, if it would be necessary to rely on imports to obtain canned meat or fish for stockpiling purposes.

Since this report deals primarily with imported items used for human food, no consideration is given here to the possible need for stockpiling such items as hides, skins, wool, fibers and cordage and animal feedstuffs. Wool and certain other fibers have been considered for the strategic stockpile for non-food industrial uses. The need for stockpiling this group of items was not believed to be within the responsibility or jurisdiction of this group.

Stockpiling of such materials for industrial uses is already provided for in various statutes, such as the Critical and Strategic Materials Stock Piling Act, the Commodity Credit Corporation Charter Act and the Agricultural Trade Development and Assistance Act.

Table 4 in the Appendix shows amounts of major agricultural products imported in 1955.

Need For Strategic Stockpiling of Food in the U. S. Territories
and Possessions

Any need for stockpiling of food for emergency use in the U.S. territories and possessions must be justified by either the expectation that a considerable portion of the food stocks and food production capacity in the area might be destroyed during a nuclear attack or the probability that emergency conditions would prevent the movement of normal quantities of food to such areas.

The U. S. Department of Agriculture lacks adequate information on location and size of commercial and military stocks of food in the U. S. territories and possessions. Stocks of food and other agricultural products owned by the U. S. Department of Agriculture and located in these areas are negligible. It is possible that local civil defense authorities may have, or could obtain, the needed information on the vulnerability of food stocks, since only five cities in the territories and possessions are listed as critical target areas by the Federal Civil Defense Administration.

Nevertheless, bomb bursts at these five places might seriously reduce food supplies in Alaska, Puerto Rico and Hawaii. Also the U. S. territories and possessions depend almost entirely on imports for many important items of food. On the basis of possible damage and assuming that transportation might be disrupted by an attack, some stockpiling of food to meet emergency period needs might be desirable. The following discussion of the food situation in each territory and possession is based on estimates of anticipated import requirements under mobilization conditions submitted by or for the governors of these areas in 1954. While some changes may have occurred, we believe these estimates to be the best available basis for a preliminary evaluation of the importance of stockpiles of food and the amounts which may be needed in these territories and possessions.

Alaska

Imports of food from areas other than the United States are negligible. For fiscal year 1955, needed food imports from U. S. were estimated at 31,200 tons of edible animal products, 100,200 tons of vegetable food products, and 9,000 tons of salt, the latter being used primarily for fish processing. Most of these products move to Alaska by sea, because the cost is lower than moving it via the Alcan highway.

Both the civilian and military population of the area are dependent on imports for most of their food. Alaskan production of food is very limited, consisting primarily of fish, potatoes, dairy products, a few fresh vegetables and some meat, a part of which is wild game. Fish is the only food that is shipped from Alaska to the United States in significant quantities.

Juneau, Anchorage and Fairbanks are listed as possible target areas. Whittier and Seward also are likely targets for a bomb attack. These cities contain a major share of the 200,000 people in Alaska. No doubt a large part of the storage stocks of imported foods are located in these cities. Stocks in other places probably could be increased, perhaps at relatively low additional cost.

The need for stockpiling food in Alaska would depend in part on the size of military food stocks in that area. Military food stocks data are classified. Some stockpiling of food in the area has been requested by territorial officials. If a method of rotation of stocks could be developed with the cooperation of commercial distributors in the territory, some stockpiling of non-perishable foods might prove practical, especially items such as flour, condensed, evaporated and dried milk, cheese, canned meat, fruits and vegetables, sugar, tea, coffee, and fats and oils. In quantity, the total stockpile would probably be small, as annual food import requirements are only about 140,000 tons per year.

Hawaii

While the Hawaiian Islands produce large quantities of food, they depend on imports to supplement their own production. Major needed imports from U. S. in fiscal year 1955 were estimated to include: 108,000 tons of feed for livestock, 57,000 tons of canned and preserved foods, 31,600 tons of rice and 20,000 tons of flour. These amounts of rice and flour constitute about 205 pounds per capita for all people in Hawaii, compared to the annual consumption of only 165 pounds of all grain products per capita in U. S. Related imports as projected included 83,000 tons of fertilizers, about 33,000 tons of beer, wine and liquor and 96,000 tons of miscellaneous foods. The Hawaiian Islands also import each year about 96,000 tons of fertilizers and about 10,000 tons of animal foods, fish and other foods from foreign sources.

The city of Honolulu is the only critical target city in Hawaii. Honolulu was the home of 248,000 people in 1950, about half of all the people in the Hawaiian Islands. It is adjacent to Pearl Harbor, and except for the amounts in distribution channels, most of the imported food stocks are probably held in this area.

Most of the imported items are products which could be stockpiled if the need can be demonstrated and if a satisfactory method for storing and rotating stocks can be developed. Livestock feeds, rice and wheat for flour are products available in U. S. government owned stocks. Further study by civil defense officials as to the need for stockpiling would appear to be needed before any decision on stockpiling in the territory of Hawaii is made. The establishment of stockpiles outside of the target area probably would require construction of storage facilities.

Puerto Rico

About 90 percent of Puerto Rico's food and feed imports normally come from the United States. Fish, corn, potatoes and meat are the major imports from other countries. Needed imports from the United States for

the fiscal year 1955-56 were estimated to consist of about 102,000 tons of animal products and 489,000 tons of vegetable products to supplement domestic production of food.

Among the estimated requirements of imported animal products, over 60 percent was meat and lard, with canned and dried milk and fish being other important groups. Vegetable product estimates included: 15,000 tons of rice, 50,000 tons of wheat flour, 84,000 tons of livestock feeds, 41,000 tons of white potatoes, 34,000 tons of canned vegetables, 27,000 tons of dry beans and 18,000 tons of canned fruit juices. These imports of rice and flour total about 180 pounds per capita for the entire population of Puerto Rico compared to continental U. S. consumption of about 165 pounds of all grains. The import needs of dry beans in Puerto Rico amount to 24 pounds per capita of the population, compared to the U. S. per capita consumption of only about 8 pounds per year. Shipments from U.S. of potatoes, canned vegetables and fruits constitute more than one-third of the per capita rates of consumption of these items in the U. S.

The city of San Juan is listed as one of the critical target areas. Its population in 1950 was 224,767, about 10% of the total in Puerto Rico. San Juan is the principal port and probably is the site of most of the storage capacity for imported foods.

Many of the imported food items are suitable for inclusion in a food stockpile if such a stockpile is found necessary. As in other areas, problems of storage and rotation of stocks would need to be solved before any stockpiling is undertaken.

Virgin Islands

Total food imports of the Virgin Islands are relatively small (estimated at about 6,500 tons in 1955), with about four-fifths normally coming from the United States. Imports of food of importance include: wheat flour, rice, evaporated and condensed milk, white potatoes, meat and lard and canned fruits and vegetables. Since there are no major military targets in the area, the need for stockpiling would be to guard against interruption of transportation. If any stockpiling in such an area could be justified, it would appear to be limited to relatively small quantities of easily storable items such as rice, wheat flour, condensed, evaporated or dry milk and vegetable oils. Fruits and vegetables are produced in abundance on the islands and any imports of these are strictly luxury items. Potatoes cannot be grown or stockpiled satisfactorily on the islands.

Guam

Imports of food are high, relative to local food production and nearly all imports come from the United States. Food imports needed in 1955 included about 95,000 sacks of rice, 70,000 cases of milk, 25,000 cwt. of sugar, 17,000 cwt. of flour, 26,000 cwt. of corn and chicken feed, 3.7 million pounds of frozen meat, 800,000 pounds of frozen fish, about 105,000 cases of fresh fruits and vegetables (@ 80 lbs. per case) and about 300,000 cases of other foods (including coffee, cheese, canned fruits and vegetables, eggs, etc.).

This area is relatively distant from the continental United States and in an area where transportation might be a problem in a war emergency. Stockpiling of food in this area appears to deserve serious consideration, even though annual food imports only total about 20,000 tons. The desirability of a relatively small stockpile of non-perishable food items might well be discussed with local people to determine availability of suitable storage, rotation problems and other possible difficulties. Shipments of rice, sugar and flour to Guam amount to about 232 pounds per capita of the population there, compared to a total per capita consumption of 260 pounds of these items per year in the U. S. In shipments of fresh fruits and vegetables and meat are about 58% and 39%, respectively of the total annual U. S. per capita consumption of these products.

Trust Territories and American Samoa

Food imports of these areas are estimated at about 1,000 tons from United States and about 4,000 tons from nearby areas. The bulk of the rice, sugar and flour come from sources outside of the United States because of the shorter hauls and trade routes in the area. Canned beef, milk and beans are among the more important imports from U. S. Some stockpiling of imported items may be justified in these territories due to the long distances which supplies must travel. Stockpiles would be useful also in case of typhoons. Military movements of both men and food into the area would likely increase in wartime. Factors limiting the practicability of stockpiling includes lack of suitable storage facilities and the high humidity which causes rapid deterioration of stored items.

Food Stockpiling In NATO Countries And Other Foreign Areas

The U. S. Department of Agriculture has contributed to the work on a study of the need for a NATO food stockpile and the problems involved in establishment and management. It is well recognized that the problems in stockpiling for NATO use are far more comprehensive than the acquisition of surplus agricultural commodities.

NATO Areas

In our view no new legislation is required to make it possible for the Department of Agriculture to make surplus commodities available for strategic NATO stockpile purposes, as may be required by the defense and foreign policy authorities. Appropriated funds, however, may be inadequate for this purpose. It should be pointed out also that strategic stockpiling, as an operation in the national interest, should be determined primarily by the security needs of the country and cannot therefore be initiated as part of a program aimed at surplus disposal. With respect to all such strategic stockpiling the Department of Agriculture will always be anxious to comply with any supply requirements for such a purpose, as determined by the appropriate defense and foreign policy authorities. The Department of Agriculture will be happy if such programs contribute to surplus disposal, but cannot initiate them.

It appears most unlikely that there is much of a chance for substantial surplus disposal through strategic stockpiling of agricultural products outside the United States, unless the United States is willing to pay for most or all of the cost of establishing such national stockpiles.

The same judgment would apply to the possibility of establishing a central stockpile in the friendly area of Western Europe, or in another friendly region. In discussions of strategic stockpiles (which, incidentally, continue) it has always been pointed out that, because of the type of protection such stockpiles ought to give, the share of the total expenditure for basic foods such as wheat, etc., probably would not exceed 15 to 20 percent of the total cost. This is because of the probable necessity, in many cases, of adding other foods, processing them into "ration" type foods, special dehydration, special packaging, storage, and shipping. It is considered that such foods probably would not replace other shipments to these countries, so that any stockpiled foods probably would be added to the total disappearance.

Stockpiling In Other Countries

A different situation exists with respect to the possibility of making surpluses available for the establishment of National Reserves in under-developed countries for exclusive use in emergencies or for economic development. Again, large-scale stockpiles could be envisaged only if the United States were to make such supplies available on a grant or very long-term loan basis, but there would be an opportunity to utilize large amounts of our surplus commodities in this manner.

The United States is already participating in an FAO Working Party on National Reserves which is, at present, examining "the practical aspects of the possible use of surplus agricultural commodities in building up national reserves to be used against crop failures and other emergencies, as well as to meet possible needs arising from slowly developing shortages as a result of economic development programs." The possibilities for surplus disposal along this line would be enhanced if the stockpiles are used to aid in population transfers from areas of scarce resources to areas of abundant resources (such as from Java to Sumatra) were included.

For the U. S. Government to embark on a policy of surplus disposal through stockpiling for this purpose on a grant basis, new legislation probably would be required. Title II of Public Law 480 authorizes surplus agricultural commodities to be made available "to meet famine or other urgent relief requirements" of friendly nations or population. It is doubtful that stockpiling to meet emergencies which might arise in the future would be authorized under this provision. Except for most unusual cases grants in aid under this provision have thus far been refused.

Table 1: Safe Keeping Time of Some Non-or Semi-Perishables
Suitable for Stockpiling 1/

Product	: Packaging :	:Months keeping time at:		Remarks
		40 ° F. :	70 ° F. :	
Coffee, green	bags	60	48-60	Listed keeping time is conservative
Cocoa	bags	48-60	24	Will absorb odors
Tea, black leaf	suitable containers	36-48	12-18	Should be kept cool and dry
Yeast, bakers active dry	canned	36-48	18	
Flour, wheat	multi-wall bags	24	9-12	Requires low humidity
Rice, parboiled	laminated paper bags	60	36	Requires low humidity
Spices and herbs	cans	48-60	24	Loss of flavor at high temperatures
Milk, dry non-fat	canned	36-60	12-24	May cake
Milk, evaporated or condensed	canned	24	12	
Cheese, American	canned	60	30-36	
Salad oil	canned	36-48	12	
Shortening, hydrogenated	canned	36-60	18-24	
Margarine	canned	60	24	
Sugar, granulated	cotton or paper bags	indefinite	indefinite	Will cake if humidity is high
Canned fruits	canned	36-60	6-24	Can may rust
Fruit juices	canned	36	6-9	Can may rust
Meat, beef	canned	60	36-40	
Meat, pork	canned	48	30	
Meat and vegetables	canned	48-60	24-48	

1/ Taken from Army Technical Manual No. 743-200, Changes No. 2.

Table 2: Stocks Of U.S. Farm Products As Percent of 1955 Domestic Civilian Utilization By Quarters

Item	:Civilian : :Use Per : Percent of Annual Needs in Stock <u>2/</u> :Capita <u>1/</u> : 1-1-55 : 4-1-55 : 7-1-55 : 10-1-55				
	(pounds)				
<u>Meats, Poultry and Fish:</u>					
Carcass meat	160.7	2.5	2.7	1.9	1.3
Fresh & Frozen Fish (1954)	5.9	12.2	11.3	10.0	14.2
Poultry, ready-to-cook	25.9	6.1	3.8	2.3	3.8
Eggs, fresh equiv.	47.6	1.3	1.7	4.7	2.8
<u>Fats and Oils:</u>					
Butter	8.9	25.8	21.3	22.9	20.1
Margarine	8.0	2.0	2.1	2.0	1.6
Shortening, incl. lard	21.3	6.4	8.2	8.2	6.1
Other fats & oils	10.0	61.4	57.0	43.7	36.0
<u>Dairy Products:</u>					
Cond. & evap. milk	15.9	8.1	3.8	13.9	16.5
Dry milk (non-fat)	6.1	29.6	17.4	30.9	14.5
Cheese (aged only)	7.7	43.4	39.7	45.4	46.5
<u>Fruits and Vegetables:</u>					
Fresh & frozen fruit & juice	110.9	10.7	5.8	4.3	7.8
Canned fruit & juice	34.9	39.0	34.7	32.8	31.6
Potatoes, white & sweet	144.7	37.5	17.1	3.2	60.1
Other fresh & froz. veg.	150.8	4.9	2.8	2.0	22.9
Canned vegetables	41.8	69.0	36.5	32.5	81.5
Baby food	3.9	50.0	46.7	41.0	46.4
Dry beans and peas	8.2	86.6	63.0	31.0	114.9
<u>Other Foods:</u>					
Wheat and Rye	222.6	244.9	202.0	169.5	293.3
Rice (milled equiv.)	8.2	289.0	241.5	178.9	285.4
Sugar and sweets (raw val.)	26.3	30.0	27.2	21.9	14.6
Peanuts (kernel basis)	5.0	18.0	32.0	18.0	30.0
Coffee (green basis)	15.1	10.5	9.2	8.6	7.3
Tea	0.6	47.6	47.6	31.7	37.7
<u>Non-Foods:</u>					
Corn for grain	3/ 2,554	110.6	82.8	61.7	40.3
All feed grains	3/ 120	89.3	64.4	45.6	52.0
Cotton	3/ 9	172.4	152.6	125.0	144.5
Tobacco	3/ 1,564	305.5	308.1	281.6	300.5

1/ Includes non-food uses.

2/ Stocks in all positions, except in retail and wholesale establishments.

3/ Total domestic use in millions of units, i.e. bushels of corn, tons of total feed grains, bales of cotton and pounds of tobacco.

Table 3: Per Capita Amounts of Foods Consumed by Civilians, Caloric Value and Retail Dollar Value in the United States in 1956

Item or Group	: Amounts Per Capita ^{1/}			: Percent of Total	
	^{2/} : 1,000		1954 ^{3/}	:	
	: Pounds	: Calories	: Dollars	: Calories	: Dollars
<u>Daily Produced Foods:</u>					
Beef, pork, veal & lamb, carcass wt.	162.5	184	\$ 81.90	15.6	30.1
Edible offal ^{4/}	10.8	7	-	.6	-
Wild game ^{4/}	2.5	1	-	.1	-
Lard	10.0	41	2.62	3.5	1.0
Butter and margarine	17.1	56	7.48	4.7	2.8
Fluid milk & cream & ice cream, milk equiv.	402.7	113	36.65	9.5	13.5
Miscellaneous non-fat dry milk products ^{4/}	67.7	16	-	1.3	-
Other dairy products	29.8	35	8.39	3.0	3.1
Chicken & turkey, pan-ready	27.9	22	13.95	1.9	5.1
Eggs, shell equiv.	367 eggs	32	14.80	2.7	5.4
Fish (fresh and processed)	10.1	7	2.52	.6	.9
Sub-Total	-	514	168.31	43.5	61.9
<u>Foods Having Long Harvest Season:</u>					
Potatoes, white	101.0	30	6.41	2.5	2.4
Vegetables, fresh	144.2	11	16.73	.9	6.1
Sub-Total	-	41	23.14	3.4	8.5
<u>Foods With Short Harvest Season:</u>					
Vegetables, processed	48.3	13	11.87	1.1	4.3
Fruits, fresh	100.6	20	11.56	1.7	4.2
processed	46.0	21	10.09	1.8	3.7
Shortening & vegetable oils	21.5	89	5.67	7.5	2.1
Sweet potatoes	7.2	3	4.55	.3	1.7
Grains, flour	121.4	201	12.14	17.0	4.5
other products	43.5	52	13.16	4.4	4.8
Sugar, refined	95.0	164	9.50	13.9	3.5
Syrups and honey ^{4/}	12.2	16	-	1.3	-
Tree nuts and soya flour ^{4/}	2.8	7	-	.6	-
Cocoa beans	4.2	5	5/	.4	5/
Peanuts, shelled ^{4/}	4.4	11	-	.9	-
Home garden products ^{4/}	97.3	13	-	1.1	-
Dry beans and peas	8.4	13	2.10	1.1	.8
Sub-Total	-	628	80.64	53.1	29.6
GRAND TOTAL, all items	-	1,183	272.09	100.0	100.0

^{1/} Amounts are estimated at the retail level and are not adjusted for loss or waste beyond that level.

^{2/} Product weight except where indicated otherwise.

^{3/} Values are based on 1954 average prices.

^{4/} Product weight and number of calories per capita in 1953. Value not available.

^{5/} Not available.

Table 4: Imports For Consumption of Major Agricultural Products
Calendar Year 1955 1/

Commodity	Unit in 1,000's	Supple- mentary	Comple- mentary	Total	Total in Thousand Short Tons
Prod. wt.					
Sugar, cane	Sh.T.	3,902.7	--	3,902.7	3,902.7
Molasses and sugar syrup	Gal.	388,894.2	--	388,894.2	2,288.3
Unfit for human consumption	Gal.	377,812.0	--	377,812.0	2,223.4
Other	Gal.	11,082.2	--	11,082.2	64.9
Coffee	Lb.	--	2,599,201	2,599,201	1,299.6
Coffee, green	Lb.	--	2,598,292	2,598,292	1,299.1
Coffee, roasted	Lb.	--	909	909	0.5
Tea	Lb.	--	104,628	104,628	52.3
Cocoa, prepared	Lb.	--	70,888	70,888	35.4
Cocoa beans	Lb.	--	499,664	499,664	249.8
Shells of cocoa beans	Lb.	--	3,444	3,444	1.7
Chocolate, prepared	Lb.	--	30,118	30,118	15.1
Wool, all, unmfg.	Lb.	181,475	185,958	367,433	183.7
Hides & skins, raw, except furs	Lb.	127,466	--	127,466	63.7
Cotton and linters	(489 lb.)				
Cotton	Bale	392.0	--	392.0	94.1
Linters	"	188.8	--	188.8	45.3
Abaca or Manilla	"	203.1	--	203.1	48.8
Jute	L.T.	--	34.8	34.8	39.0
Jute, unmfg.	L.T.	52.3	--	52.3	58.6
Jute, Butts	L.T.	47.5	--	47.5	53.2
Hemp Tow	L.T.	4.9	--	4.9	5.5
Hemp, not hackled	L.T.	.1	--	.1	.1
Sisal and henequen	L.T.	.1	--	.1	.1
Oil seeds	L.T.	--	147.4	147.4	165.0
	Sh.T.	400.6	--	400.6	400.6

1/ Source: Report No. Ft. 110 "United States Imports of Merchandise for Consumption", for Calendar Year 1955, issued May 1956 by U. S. Department of Commerce, Bureau of the Census.

